

Memorandum

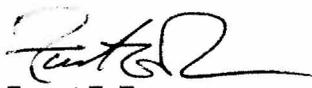


DATE 6 June 2014

TO The Honorable Members of the Transportation and Trinity River Project Committee:
Vonciel Jones Hill (Chair), Lee Kleinman (Vice Chair), Deputy Mayor Pro Tem Monica Alonzo,
Mayor Pro Tem Tennell Atkins, Sandy Greyson, and Sheffie Kadane

SUBJECT **Resource Recovery Planning and Implementation – On the road to Zero Waste**

On Monday, 9 June 2014, the Transportation and Trinity River Project Committee will be briefed on Resource Recovery Planning and Implementation – On the road to Zero Waste. The briefing materials are attached for your review.



Forest E. Turner
Assistant City Manager

Attachment

c: Honorable Mayor and Members of the City Council
A. C. Gonzalez, City Manager
Warren M.S. Ernst, City Attorney
Craig D. Kinton, City Auditor
Rosa A. Rios, City Secretary
Daniel F. Solis, Administrative Judge
Ryan S. Evans, Interim First Assistant City Manager
Jill A. Jordan, P.E., Assistant City Manager

Joey Zapata, Assistant City Manager
Theresa O'Donnell, Interim Assistant City Manager
Charles M. Cato, Interim Assistant City Manager
Jeanne Chipperfield, Chief Financial Officer
Shawn Williams, Interim Public Information Officer
Elsa Cantu, Assistant to the City Manager – Mayor & Council



Resource Recovery Planning and Implementation – On the Road to Zero Waste

Transportation and Trinity River Project Committee

9 June 2014



Background

- **The City of Dallas generates an estimated 2.2 M tons of waste annually from residential and commercial sources**
 - **1.4 million tons of waste is disposed annually at McCommas Bluff Landfill**
 - **435,000 tons of this waste stream is collected by Sanitation Services annually**
 - **230,000 tons of refuse**
 - **150,000 tons of brush and bulk**
 - **55,000 tons diverted via recycling annually**
- **The City has proactively managed solid waste in Dallas for years through disposal, recycling, diversion and re-use efforts**
 - **McCommas Bluff Landfill (~50 year remaining capacity)**
 - **Recycling collection (household & drop-off site)**
 - **Household hazardous waste and electronics collection**
- **To meet the projected solid waste needs of Dallas' growing population, the City is planning for the future**

Background

- **The City Council adopted a Local Solid Waste Management Plan [“LSWMP”] in February 2013**
 - The plan sets targeted goals and timelines consistent with Dallas’ priority for Zero Waste by 2040
 - Identifies policies, programs and infrastructure needed to manage municipal solid waste and recyclables
- **LSWMP sets milestones for diversion**
 - 40% in 2020
 - 60% in 2030
 - 80% - 85% (Zero Waste) in 2040

Moving Forward

- The City is planning to transition away from traditional, landfill-based waste management practices to a resource recovery focus.
- The City is committed to programs such as single stream (blue bin) recycling and landfill gas recovery. These programs are assumed to continue as resource recovery plans move forward.
- In March of 2013, City Council approved a contract with SAIC Energy, Environment & Infrastructure, LLC (now Leidos Engineering LLC) for Phase I work to:
 - Provide resource recovery planning services
 - Evaluate waste diversion opportunities and resource recovery technologies
 - Provide recommendations on which technologies Dallas should or should not consider, either through City investment or a public-private partnership
 - Provide potential implementation recommendations

Phase I Work Complete

Major Phase I Tasks

Waste Characterization Analysis (Residential and Commercial Municipal Solid Waste)

Review of Potential Resource Recovery Technologies

Screening Analysis of Potential Resource Recovery Technologies

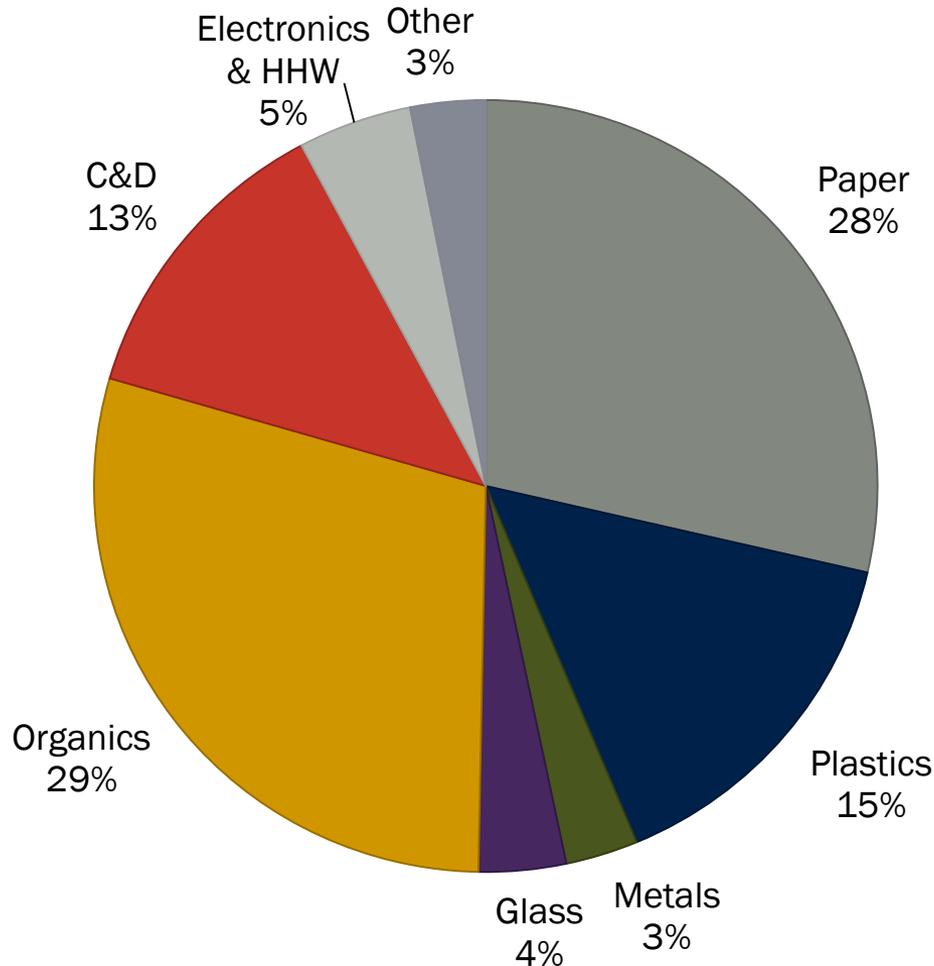
Detailed Analysis of Shortlisted Technologies

Potential Implementation Plan and Recommendations

Case Study Reviews of Resource Recovery Parks

Report and Presentation

Waste Characterization Results



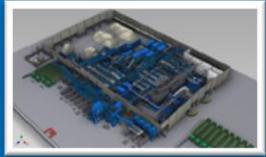
- **Collected waste samples from thirty (30) residential refuse and twenty-two (22) commercial refuse collection vehicles.**
- **Each sample weighed two hundred (200) pounds.**
- **Waste samples were manually sorted and weighed to estimate composition of waste stream.**
- **Estimates reflect 90% confidence interval.**

Note: HHW – Household Hazardous Waste
C&D – Construction and Demolition

Waste Characterization Key Findings

- **Opportunity exists to recover additional recyclable materials through the single-stream recycling program**
 - City residents are presently recycling 55,000 tons annually
 - Additional 75,000 tons per year of recyclables currently being disposed
- **Commercial generators disposing of approximately 140,000 tons of additional recyclable material annually**
- **Substantial amounts of yard waste and foods scraps are landfilled**
 - Residential yard waste and wood: 30,000 tons annually
 - Residential food scraps: 53,000 tons annually
 - Commercial food scraps: 69,000 tons annually

Potential Resource Recovery Technologies that Would Divert Material from Landfill

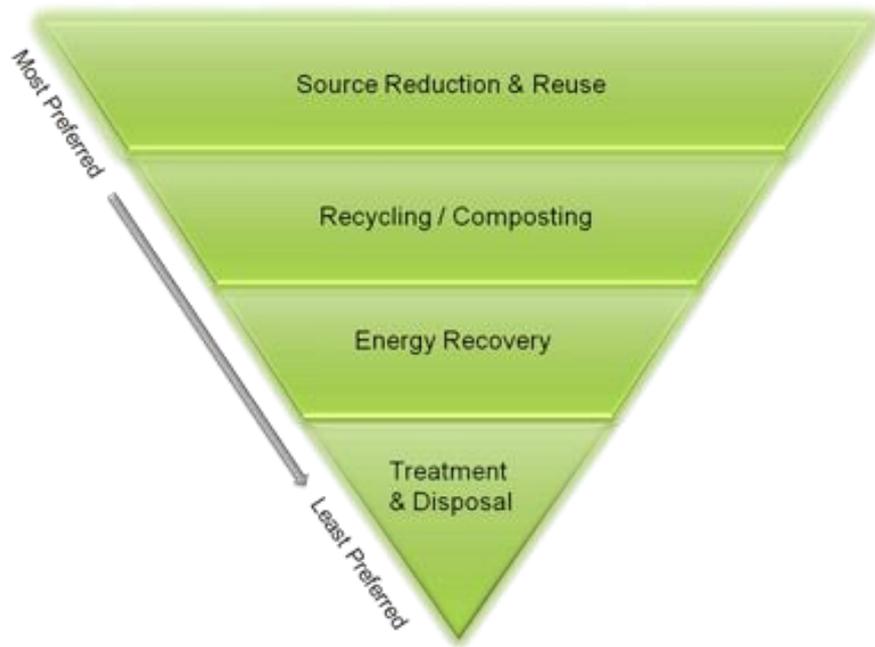
Technology	Description
 <p>Single Stream Processing</p>	<p>Sort mixed recyclable materials (blue bin), that are collected separately from refuse, and prepare for sale at market. Minimal residue remains after processing.</p>
 <p>Mixed Waste Processing ["MWP"]</p>	<p>Process residential and/or commercial mixed waste, separating out the recyclable materials and preparing them to be sold at market. Remaining material disposed as residue.</p>
 <p>Gasification</p>	<p>Process waste feedstock at high temperatures to produce an energy-rich synthesis gas and other products. Remaining material disposed as residue.</p>
 <p>Anaerobic Digestion</p>	<p>Process organic materials anaerobically (without oxygen) using microorganisms to produce a methane-rich biogas and other products. Remaining material may be composted and/or disposed.</p>

Screening Analysis Conducted to Select Technologies for Further Evaluation

- **A screening workshop was conducted with City staff to select technologies for further evaluation based on the following criteria:**
 - **Level of diversion achievable**
 - **Capital and cooperating cost (economic viability)**
 - **Compatibility with City's current operations**
 - **Status of development**
 - **Permitting complexity (including environmental impacts)**
 - **Project delivery options available (e.g. City-owned or Public-Private Partnerships)**

Level of Diversion Achievable with Potential Technologies

Waste Management Hierarchy
Source: U.S. EPA



Note: Recycling rate percentages for all technologies includes single stream

Technology	Residential Diversion		
	Recycle	Energy	Total
Single Stream	20%	0%	20%
MWP <i>with disposal</i>	34%	0%	34%
MWP <i>with gasification</i>	34%	56%	90%
MWP <i>with Anaerobic Digestion</i>	34%	11%	45%
Gasification	20%	69%	89%
Anaerobic Digestion	20%	6%	26%

Technologies Screening Analysis: Focus on Single Steam and Mixed Waste Processing

Technology	Rationale	Analysis Results
Gasification <i>Eliminated</i>	Lack of U. S. operating facilities; relative high degree of permitting and operational risk; relative high cost	Technology developing, reevaluate in five years
Anaerobic Digestion <i>Eliminated</i>		
Mixed Waste Processing <i>Selected</i>	Opportunity to recover commercial solid waste; commercially proven/developed within United States	Conduct detailed analysis
Single Stream <i>Selected</i>	Consistent with existing system; commercially proven; need exists to process material already collected; opportunity to increase recovery	Conduct detailed analysis

Additional Details Regarding the Elimination of Gasification and Anaerobic Digestion

- **Gasification**
 - Processing cost of \$70 – \$190 per ton
 - No facilities currently operating commercially in United States with municipal solid waste as feed stock. (The technology has been selected for domestic projects, but many are on hold.)
 - No similar facilities have been permitted in Texas
- **Anaerobic Digestion**
 - Processing cost of \$65 – \$140 per ton
 - No full-scale commercially operating facilities using municipal solid waste as a feedstock in United States
 - No similar facilities have been permitted in Texas
 - Uncertain markets long-term for beneficial use of residual (digestate)

Detailed Analysis Conducted to Select Technologies for Potential Implementation

- Further evaluated single stream and mixed waste processing based on the following criteria:
 - Diversion Potential
 - Status of development
 - Permitting and regulatory issues
 - Technical and business risk
 - Financial feasibility
- The City issued a Request for Information and Leidos conducted interviews with private companies to gain further insight regarding potential partnerships for single stream and mixed waste processing

Mixed Waste Processing (MWP): Results of Detailed Analysis

- **MWP is not financially viable at this time**
 - A facility would increase costs at McCommas Bluff Landfill by approximately \$5 million annually, which is a 30% increase
 - Depending on volume and commodity values, processing cost could be \$75 – \$115 per ton of diverted material (versus net revenue for single stream recycling)
 - Concern regarding the value of commodities from MWP
- **MWP has more technical and business risk than single stream**
 - Has been proven on a commercial scale in other parts of the United States, but has not been developed for commercial use in Texas
 - Financial performance would have a direct impact on the landfill
- **Key recommendations**
 - City should not move forward with a distinct MWP facility at this time
 - Request For Proposal [“RFP”] for single stream could include the option for processors to process select, recyclable rich, dry loads of mixed waste

Single Stream Recycling: Results of Detailed Analysis

- **A single stream facility is financially and technically feasible**
 - Need 75,000 to 85,000 annual tons to break even (currently the city processes 55,000 tons annually)
 - Depending on tonnages and commodity values, City could realize from \$0 to \$40 per ton of net revenue
 - Based on tonnage, technical, and financial requirements a public-private partnership is recommended
- **Locating facility at the landfill could provide significant financial benefit**
 - Undeveloped site would increase capital cost by \$1.5 - \$2.5 million
 - Annual operating cost increases \$75,000 - \$150,000 if not located at landfill
- **Key recommendations**
 - Conduct procurement that allows direct comparison between a processing services agreement and a recycling facility located at McCommas Bluff Landfill
 - Consider options for a public-private partnership for a single-stream facility

Developing a Resource Recovery Park at Current McCommas Bluff Landfill Site

- **Opportunity to convert the current McCommas Bluff Landfill site to a Resource Recovery Park [“RRP”] over a period of time**
 - Components of a RRP already in place (landfill gas recovery and citizen electronics drop-off)
 - City has identified a 30-acre site within the McCommas Bluff Landfill permitted boundary as a potential location for a single stream MRF and/or a future MWP facility
 - New resource recovery facility could anchor a resource recovery park
- **Potential additional features of a RRP could include:**
 - Composting facility
 - Material reuse center
 - Household hazardous waste collection
 - Construction & demolition materials recycling
 - End use facility for processed commodities

Recommendations

- **City needs to begin now to procure a new agreement to process single stream recyclables**
 - **Current Single Stream processing agreement expires in December 2016**
 - **Develop a new long term agreement (20 year with renewal options)**
 - **Consider a traditional processing service agreement (similar to current agreement), as well as look at developing a facility at McCommas Bluff Landfill through a public-private partnership agreement**
 - **Process will require 12 – 48 months**
- **City should consider re-evaluating emerging technologies in 3-5 years**
- **City should look for opportunities to transform McCommas Bluff Landfill to more of a Resource Recovery Park over time**

Next Steps

- **25 June 2014 - Council Consideration for a Supplemental Agreement with Leidos Engineering, LLC for Phase II work related to:**
 - Prepare documents and technical specifications for a multi-option RFP
 - Assist in pre-proposal coordination and addendum preparation
 - Assist with evaluation of proposals and proposer interviews
 - Assist with proposal selection and additional services as needed
- **Summer 2014 provide outreach to communities and educational institutions in the Southeast Oak Cliff area and discuss opportunities related to a material recycling facility at the landfill.**
- **Fall 2014 issue RFP related to single stream recycling**

Questions?